<u>LIST OF CLAIMS</u>

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claims 1-7 Cancelled

8.   (new) A method for processing a unidirectional heap data structure in a pipelined manner, comprising:

defining a node group having a plurality of nodes to represent a root node;

storing values associated with each of the plurality of nodes contiguously in memory;

sharing a single pointer referencing a lower level of node groups, each of the lower level node groups being stored contiguously; and

performing a mixture of insert, remove, or swap operations on the heap data structure without stalling a pipeline performing the operations.

9.   (new) The method of claim 8, further including,

storing values for the lower level node groups in a separate memory system from a system storing the values associated with the plurality of nodes, wherein the values for the lower level node groups are different from the values associated with the plurality of nodes.

10.   (new) The method of claim 8, further including,

associating a counter with the single pointer; and

setting the counter to represent a number of holes below the single pointer.

11.　(new) The method of claim 10, further comprising:

decrementing the counter when the single pointer is traversed during an insert operation; and

incrementing the counter when the single pointer is traversed during a remove operation

12.　(new) The method of claim 9, further comprising:

storing values for each successive node group level in respective separate memory systems.

13.　(new) The method of claim 8, further comprising:

initiating a remove operation on the data structure while an insert operation is progressing on the data structure.

14.　(new) A computer readable medium having program instructions for processing a unidirectional heap data structure in a pipelined manner, comprising:

program instructions for defining a node group having a plurality of nodes to represent a root node;

program instructions for storing values associated with each of the plurality of nodes contiguously in memory;

program instructions for sharing a single pointer referencing a lower level of node groups, each of the lower level node groups being stored contiguously; and

program instructions for performing a mixture of insert, remove, or swap operations on the heap data structure without stalling a pipeline performing the operations.

15.   (new) The computer readable medium of claim 14, further including,

program instructions for storing values for the lower level node groups in a separate memory system from a system storing the values associated with the plurality of nodes, wherein the values for the lower level node groups are different from the values associated with the plurality of nodes.

16.   (new) The computer readable medium of claim 14, further including,

program instructions for associating a counter with the single pointer; and

program instructions for setting the counter to represent a number of holes below the single pointer.

17.   (new) The computer readable medium of claim 16, further comprising:

program instructions for decrementing the counter when the single pointer is traversed during an insert operation; and

program instructions for incrementing the counter when the single pointer is traversed during a remove operation

18.   (new) The computer readable medium of claim 15, further comprising:

program instructions for storing values for each successive node group level in respective separate memory systems.

19.   (new) The computer readable medium of claim 14, further comprising:

program instructions for initiating a remove operation on the data structure

while an insert operation is progressing on the data structure.